



#9 Ref to
PATENT
740756-2218

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of
Hongyong ZHANG et al.
Serial No. 09/695,414
Filed: October 25, 2000
For: METHOD FOR FORMING
SEMICONDUCTOR DEVICE

) Group Art Unit: 2813

) Examiner: E. Pert

) CERTIFICATE OF MAILING
I hereby certify that this correspondence is being deposited with
the United States Postal Service with sufficient postage as First
Class Mail in an envelope addressed to: Assistant Commissioner
for Patents, Washington, D.C. 20231, on April 4, 2002.

) Deborah J. Sonne

REQUEST FOR RECONSIDERATION

Honorable Commissioner of Patents
Washington, D.C. 20231

Dear Sir:

In response to the Examiner's non-final Office Action mailed December 4, 2001, the period for responding having been extended One (1) month, please consider the following amendments and remarks in connection with the above-identified application.

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the present application.

The Examiner's non-final Office Action dated December 4, 2001 has been received and its contents carefully noted. Claims 1-18 were pending in the present application, of which claims 1, 4, 7, 10, 13 and 16 are independent.

Pages 4 and 5 of the Specification are Attached

The Examiner noted that pages 4 and 5 are missing from the file wrapper. The Applicants have provided the Examiner with a copy of pages 4 and 5 of the specification, attached herewith.

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The Specification Fully Supports the Features of the Claimed Invention

The Examiner has objected to the specification under 37 CFR 1.71(c). The Applicants traverse the Examiner's objection. The Applicants respectfully submit that the specification particularly points out the features of the method of the present invention in such a manner as is necessary to provide a complete understanding and description of the invention. The Applicants further submit that at least the last feature of claims 1, 7, 10 and 16:

wherein the step of crystallizing said semiconductor film is carried out successively after the formation of said crystallization promoting material without exposing said semiconductor film and said crystallization promoting material to the air outside said chamber

and the last feature of claims 4 and 13:

wherein the step of forming the crystallization promoting material and the step of crystallizing said semiconductor film are conducted successively in a same chamber without exposing said semiconductor film and said crystallization promoting material to the air outside said chamber

are fully supported by the specification at page 3, line 30 – page 4, line 2; page 6, lines 15-16; and page 9, lines 30-31.

heat in chamber

Claims 1-18 are Patentable over Liu in View of Turner;

The Examiner has Not Made a *Prima Facie* Case of Obviousness

Claims 1-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Liu et al., U.S. Patent No. 5,147,826 (Liu) in view of Turner et al., U.S. Patent No. 5,512,320 (Turner). The Applicants respectfully traverse the Examiner's rejection because the Examiner has not made a *prima facie* case of obviousness.

It should be noted that three criteria must be met to establish a *prima facie* case of obviousness. *M.P.E.P. § 2143*. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings to achieve the claimed invention. *Id.* Second, there must be a reasonable expectation of success. *In re Rhinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976). Third, the prior art must teach or suggest all the claim limitations. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

The Applicants respectfully contend that the Examiner has not set forth a *prima facie* case of obviousness. There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Liu or ^{wrong} Turner or to combine reference teachings to achieve the claimed invention.

The Examiner concedes that Liu does not teach or disclose "that the substrate under processing should not be exposed to air from the time the metal is deposited to the time the amorphous film is crystallized" (p. 3, ¶ 3, Paper No. 7). The Examiner contends that although Liu does not teach that a substrate under processing should not be exposed to air from the time a metal is deposited to the time an amorphous film is crystallized, that it would have been obvious to utilize the same tool or cluster and one of ordinary skill in the art would have been motivated to avoid exposing a substrate to air after nickel is formed, for example, to prevent the nickel from oxidizing. The Examiner further contends that the Turner apparatus would allow higher throughput in practicing the invention of Liu and one of ordinary skill in the art, at the suggestion of Turner, would be motivated to combine multiple process steps in a single vacuum chamber, combining process steps for reduced floor space and higher through-put.

However, the Applicants respectfully submit that this rejection is not appropriate since there is no suggestion to combine Liu and Turner. If it would have been obvious to one with ordinary skill in the art to utilize the same tool or cluster, then the Liu method should not have exposed the substrate to air. The Examiner contends that the substrate is not exposed to air to prevent the nickel from oxidizing; however, Liu discloses that the crystallization processes are performed in an oxygen atmosphere (col. 5, lines 58-63). The Applicants further submit that it is unclear whether the Examiner is correct in asserting that a nickel film is easily oxidized at a room temperature when exposed to the air. However, even assuming the Examiner is correct, it should be noted that Liu appears to expose the metal film to an oxidizing atmosphere (for example, see col. 5, lines 58-60) and, nevertheless, the metal film of Liu appears to function to promote crystallization.

first
by
Turner

In addition, the Turner apparatus does not relate to the Liu process. Therefore, there is no suggestion to combine Liu and Turner.

Even assuming motivation could be found, the Examiner has not given any indication that one with ordinary skill in the art at the time of the invention would have had a reasonable

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expectation of success when combining Liu and Turner. In the proposed combination of Liu and Turner, a surface of the semiconductor film may be accidentally contaminated with an impurity or dust. The existence of the impurity or dust may hinder the uniform crystallization based on the metal for promoting crystallization. Such a possibility can be avoided in the present invention.

inherently not
Furthermore, the prior art does not teach or suggest all the elements of the claims, either explicitly or inherently. There is absolutely no reference which suggests or teaches that the substrate should not be exposed to the air after forming the metal film as recited in the claims of the present invention. The Applicants specifically traverse the Examiner's assertion that such a feature is a matter of design choice.

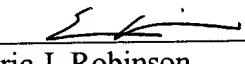
The Applicants further contend that even assuming, *arguendo*, that the combination of Liu and Turner is proper, there is a lack of suggestion as to why a skilled artisan would use the proposed modifications to achieve the unobvious advantages first recognized by the Applicants. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680 (Fed. Cir. 1990).

For the reasons stated above, the Examiner has not set forth a *prima facie* case of obviousness; therefore, the Applicants respectfully request that the Examiner withdraw the § 103 rejections.

Conclusion

Having responded to all rejections set forth in the outstanding non-final Office Action, it is submitted that the claims are now in condition for allowance. An early and favorable Notice of Allowance is respectfully solicited. In the event that the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, the Examiner is courteously requested to contact Applicants' undersigned representative.

Respectfully submitted,


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Enclosure: Pages 4 and 5 of the Specification (2 pages)